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A COMPARISON OF THE INTELLECTUAL AND EDUCATIONAL STATUS OF NEUROTIC AND NORMAL CHILDREN IN PUBLIC SCHOOLS

BY

ESTHER KATZ ROSEN, PH.D.

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E. K. R.

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INTELLECTUAL AND EDUCATIONAL STATUS OF NEUROTIC AND NORMAL CHILDREN IN PUBLIC SCHOOLS

CHAPTER I

INTRODUCTION

DISCUSSION OF THE PROBLEM

THERE is no dearth of subjective opinion as to what are the distinguishing marks of the neurotic individual. Sharply defined character traits, intellectual abilities, characteristics desirable and undesirable, are parceled out as if they were actual possessions of the neurotic personality. Whether these delineations present a desirable or an undesirable picture depends upon the particular writer.

Cameron [13, p. 10] [1] emphasizes the inherent possibilities of the neurotic individual: "A sensitive nervous organization is often the mark of intellectual possibilities above the average and the children who are cast outside the ordinary mould, who are the most wayward, most intractable, who react to trifling faults of management with the most striking symptoms of disturbance, are often those with the greatest potentialities for achievement and for good. . . . The mother of the nervous child may often rightly take comfort in the thought that her child is worth the extra trouble and extra care which he demands, because he is sent into the world with a mechanism which, just because it is more powerful than the common run, is more difficult to master and takes longer to control and to apply for useful ends."

This quotation gives to the neurotic make-up a certain glamor, it holds its "possessor" in high esteem. A rather different picture is presented by Hollingworth [24, p. 70]: "Neurotics are those

[1] Throughout this study, numbers in brackets refer to the numbered references in the Bibliography, pp. 45-48.

who are characteristically inferior in these essential qualities, among others,—an ordinary degree of coöperation, adherence to definite directions, power of sustained effort, and fidelity to bare facts. Where impulsive response, negativistic attitude, flightiness and illusion cause failure, neurotic children fail. . . . . Nervous instability may be found in combination with any degree of I Q, apparently, from dullest to brightest. The relation between them is not certainly known, though there is now considerable indication that the correlation between stability and intellect will be found to be positive and high (but not perfect). This would mean that there are very probably more ill-balanced children among the stupid than elsewhere in the distribution of I Q. That organic quality, which shows itself in superior intelligence, robustness and longevity, also shows itself in nervous stability, more likely than not."

Many statements are recalled upholding these varying points of view. In the course of conversation, a Johns Hopkins psychiatrist remarked: "Of course, only the bright children are the neurotic. You do not find stupid children showing neurotic traits."

This is also the viewpoint of Trigant Burrow [11, p. 179], and of the majority of the psycho-analytic school: "The neurotic patient is frequently far above the average intellectually."

These quotations express the general and popular belief in compensation, which belief is crystallized in such adages as "Easy come, easy go." "Beauty is only skin deep." "The meek shall inherit the earth."

As Gates says [17, p. 194]: "There is a conviction that people extraordinarily competent along one line must be deficient in another. If the other fellow learns rapidly, he will retain poorly. The pretty girl has little sense. The highly intelligent are nervous, unstable or physically inferior. All of these generalizations are, in fact, incorrect."

Thus Thorndike [56, p. 363] frames a generalization based on psychological evidence: "In original nature, the rule is correlation, not compensation."

In this confusion of opinion, of which further illustration need not be given, there is to be found, nevertheless, among the majority of definitions of the term, neurotic, a middle ground dealing with the problem of adjustment.

Blumgart [7, p. 337] says: "The neurotic child is the emotionally maladjusted. Maladjusted children are those whose conduct at home, at play, and in the school, does not fit them into their environment. Maladjustment is largely the use of errors and false solutions as habitual methods of adjustment to life."

Gates [17, p. 186] says: "Neurotic individuals: easily upset, very sensitive to difficulties in adjustment."

Dr. Francis L. Dunham, by whose diagnosis the majority of the children herein studied were selected, says: "Neurotic is a descriptive term used to indicate tendencies resulting from inadequately controlled reactions of the involuntary nervous system. Diagnosis is based upon the presence of unusual personal habits developing therefrom. The development and organization of 'character' is our chief *criterion,* since most of these habits enter into the conduct of the individual."

PURPOSE OF THE STUDY

In the course of clinical experience, valuable empirical evidence has been gathered which presents varying findings on the neurotic personality,—his intelligence, capacity, performance, and various behavior traits. The conflicting conclusions arrived at by various investigators furnished the stimulus for this study.

What facts would be revealed by a study planned to test out this empirical evidence? If these characteristic traits appear when neurotic and normal individuals are tested under the same conditions, then these positive results would lend their bit of weight to the possibility, already initiated, of objective identification of the neurotic child. If, however, such differences do not appear, then these negative results would caution us to question the hard and fast distinctions which have sometimes been made between the neurotic and the normal. (It should be stated here that *normal* or *normal mate* is used throughout this study to mean *non-neurotic.*)

The question we set ourselves is: What are the differences in intellectual and educational status between the normal child in public school and the neurotic child who is able to maintain himself in school? In the attempt to reveal the differences of the

[1] All the tests were administered and scored by the experimenter.

two groups which had been asserted to exist between them, the following tests were administered: [1]

1. Stanford Binet Test. From this, it was hoped to get light on such points at issue as:
   - *a.* Does the curve of intelligence for neurotic children conform to that for normal children?
   - *b.* Are there any particular tests in which neurotics consistently fail?
   - *c.* Is there a greater scattering over the range of the scale among neurotic children?

2. A second Stanford Binet, given two weeks after the first, for data on the question as to whether neurotic children vary more than the normal on retests.

3. Pintner-Paterson Short Performance Scale:
   - *a.* Will one group surpass the other?
   - *b.* Is there a tendency for either group to earn a higher score on the performance than on the Stanford Binet?

4. Pintner Educational Survey Tests:
   - *a.* Is there a tendency for the school achievement of the neurotic group to fall below their capacity as demonstrated on the Stanford Binet?
   - *b.* Do neurotic children fall lower in certain school subjects than in others?

5. Handwriting test, measured by Thorndike Handwriting Scale.

   Cyril Burt [12, p. 71] described the handwriting of neurotic children as "irregular and untidy." Will the quality of their handwriting thus reveal their neurotic tendencies?

6. Cancelation tests.

   Is the neurotic child more careless and inaccurate?

CHAPTER II

METHOD OF PROCEDURE

SELECTION OF CHILDREN

This study was begun in New York City in the spring of 1923. Public School No. 64, Manhattan, maintained for a time a class for pupils diagnosed as neurotic by the school psychiatrist; and ten boys who had formerly been in this neurotic class formed part of the group of fifty neurotic children studied. The remaining forty were in the Baltimore public schools and were described as neurotic by the psychiatrist of a children's bureau. The subjects were all of Russian Jewish parentage, as it was considered that results would be more comparable if the group were racially homogeneous.

The forty Baltimore children were secured from a social service bureau to which are referred all children of families who are clients of the family welfare society of this social service agency. Every child brought to this bureau is taken as a matter of routine to the bureau's psychiatrist. For purposes of this study, he selected from his records children diagnosed as neurotic who presented no physical problem, and who were in public schools.

Investigations are necessarily influenced by the kind of sample secured. There is the possibility that in this study the findings on the points at issue enumerated in Chapter I might be influenced by the fact that the neurotic children are cases in which the diagnosis of "neurotic" was paid for by philanthropy. It is conceivable that a group of neurotic children secured from a list of private cases of a psychiatrist would give different results. This study used as controls children who were of the same social stratum as the neurotic group,—children who were taken from the same school and who came therefore from the same neighborhood.

Each neurotic child studied was paired with a normal mate for purposes of comparison. The constants for each pair were

sex, nationality, chronological age, grade, and school. The intention, of course, was to have as far as possible only the one differentiating variable,—the possession of neurotic traits.

The following procedure for selection of a normal child to pair with the neurotic child was used. After locating the neurotic child in his grade in school, the record cards for that grade were secured, from which selection was made of that normal pupil who was of the same sex and nationality, and whose age did not differ more than six months,—the nearest in age being selected. If there were no such child in this particular class, search was made in the other like grades of the same school. If this plan failed to yield the desired mate, a similar search was made in the nearest school of the district. In nineteen cases it was necessary to search for a mate outside of the school in which the neurotic was found. The constant factors of grade and school were selected to secure similarity of environmental influences for the pair; nearby schools in the same district would furnish very much the same desideratum.

When selection of the normal child had been made, his teacher was asked whether he presented any particularly difficult or baffling problem, as even such a gross observation suggests neurotic traits. If such were the case, another selection of a child next closest in age was made. Later on, after contact had been established between experimenter and subject, each normal child was asked if he had ever been to a hospital, and if he had, he was asked to which hospital he had gone, and for what purpose and who the doctor was. This information was elicited, of course, for the purpose of finding whether the child had ever been to a psychiatric clinic. If so, the child did not qualify as a normal mate for the pair. The experimenter has been confronted several times with this question: How do you know that your so-called normal child might not, on psychiatric examination, prove to be one of the group labeled neurotic? The answer was: If a child's course of conduct has been such as not to single him out or to draw attention to him as abnormal, or in need of corrective treatment, the fair assumption is that he is a normal child.

The suggestion that each child selected as a normal mate be taken to a psychiatrist for examination was not possible of execution. First, clinics are sufficiently occupied with children known to need their services; second, the time allowed the

experimenter to have these children away from their classrooms was limited; and third, the parents would probably have objected strenuously. The experimenter concluded, after weighing these facts and after benefit of expert counsel, that it was fair and sound to assume that children thus selected as normal were normal.

PROCEDURE

The experimenter, after locating the neurotic children who were in one particular school, selected their normal mates in the manner explained. These children were then released from their classrooms and were brought together in an empty room, usually the teachers' rest-room, a vacant classroom, or the school-nurse's room. The experimenter then vouchsafed the following explanation to the group:

"Did you ever hear of Columbia University in New York? (If in Baltimore, the remark was added that it was a place like Johns Hopkins University, or the University of Maryland.) Teachers from all over the United States and from many other countries go there to learn the best ways of teaching you boys and girls. Now, one thing we are studying is: Just what things and how many and how hard things, can boys and girls do at different ages and in different grades?

"We want to know, for example, how much more to expect of a sixth-grade girl or boy than of a fifth; how much more an eleven-year-old boy or girl can do than one who is nine or ten, because, of course, the older you grow, the more you are generally able to do. Isn't that so? Now, the one way we can find out these things is to have many boys and girls of all different ages and different grades do certain things and answer certain questions for us. Many children in New York City and in other schools here have helped. The work has nothing to do with your own teacher or class. It is simply to help us in our study. I needed more boys and girls of your particular grades and ages, and so from the teachers' record cards, I happened to choose your names. Will you be willing to help?"

With one exception, coöperation was offered with immediate cordiality and interest.

After rapport had thus been established, the group-tests were given. The first contact with the individuals selected was inten-

tionally made with them in a group so that the individual would not think he had been singled out as an object of special attention.

The first test distributed was the Pintner Educational Survey. This was followed by the handwriting test and the cancelation series. The children were then told that the remainder of the work was to be done by each child alone, and all except one of the group returned to their classrooms. The Pintner-Paterson Performance Scale and the Stanford Binet were given next to each child. Two weeks after the first Stanford Binet, the experimenter returned and gave each child a retest.

DATA REGARDING THE TWO GROUPS

Tables I through IV tabulate the chronological and mental ages, the I Q's and the grades of the individuals in the two groups.

Table I reads: Of the 50 children in the neurotic group, one was seven years chronological age; one was eight years chronological age, etc. Of the fifty children in the normal group, two were seven years chronological age, none were eight years, etc. As has been explained, chronological age was one of the factors constant for each pair and each individual is within six months chronological age of his mate.

TABLE I

CHRONOLOGICAL AGES OF INDIVIDUALS STUDIED

Group	Chronological Age								No.
	7	8	9	10	11	12	13	14	
Neurotic	1	1	5	7	11	13	8	4	50
Normal	2	0	4	8	11	14	6	5	50
Total	3	1	9	15	22	27	14	9	100

Table II reads: Of the 50 children in the neurotic group, 2 were 7 years, mental age; 7 were 8 years, mental age, etc. Of the 50 children in the normal group, 5 were 7 years, mental age; 3 were 8 years, mental age, etc. (The mental age is obtained from the Stanford Binet Test.)

TABLE II

MENTAL AGES OF INDIVIDUALS STUDIED

Group	Mental Age											No.
	7	8	9	10	11	12	13	14	15	16	17	
Neurotic	2	7	15	4	10	1	6	4	0	0	1	50
Normal	5	3	13	10	7	4	7	1	0	0	0	50
Total	7	10	28	14	17	5	13	5	0	0	1	100

Table III reads: Of the 50 children in the neurotic group, none were below 66 I Q; 2 had I Q's between 66 and 70; none had I Q's between 70 and 74, etc. Of the 50 children in the normal group, 2 had I Q's between 54 and 58, none had I Q's between 58 and 62, etc.

TABLE III

INTELLIGENCE QUOTIENTS OF INDIVIDUALS STUDIED

Group	Intelligence Quotient										
	54	58	62	66	70	74	78	82	86	90	94
Neurotic	0	0	0	2	0	4	6	4	11	4	5
Normal	2	0	1	0	2	2	6	5	5	8	5
Total	2	0	1	2	2	6	12	9	16	12	10

Group	Intelligence Quotient									No.
	98	102	106	110	114	118	122	126	130	
Neurotic	3	5	1	0	1	1	2	0	1	50
Normal	6	5	2	1	0	0	0	0	0	50
Total	9	10	3	1	1	1	2	0	1	100

Table IV reads: In each group, 1 is in Grade 1; 2 are in Grade 2; etc. As has been explained, the factor of grade location was constant for each pair, therefore there are the same number of neurotic and normal individuals in each grade.

TABLE IV

GRADE LOCATION OF INDIVIDUALS STUDIED

Group	Grade								No.
	1	2	3	4	5	6	7	8	
Neurotic	1	2	3	13	12	12	4	3	50
Normal	1	2	3	13	12	12	4	3	50
Total	2	4	6	26	24	24	8	6	100

CHAPTER III

TREATMENT OF RESULTS

STANFORD BINET TESTS

No significant difference was found between the two groups in intelligence as measured by the Stanford Binet Tests. The curve for the neurotic group begins at a higher point and ends at a higher point, but the great amount of overlapping is the outstanding fact. Ninety-four per cent of the normals are contained between the limits of the I Q of the neurotics.

TABLE V

STANFORD BINET RESULTS

	Neurotic	Normal
Mean IQ	92.32 ± 1.33	89.52 ± 1.19
S. D.	13.94	12.44
S. D. Difference	2.64	2.64
M. A.	10 yr. 10 mos.	10 yr. 6 mos.
Total IQ Range	68–130	58–113
Lower quartile	68–82.5	58–82
Middle 50 Per Cent	82.5–100	82–99
Upper Quartile	100–130	99–113
Below 96 IQ	66%	66%
Between 96–105 IQ	22%	28%
Above 106 IQ	12%	6%

The middle 50 per cent is contained within almost the same limits in each group, between 82.5 and 100 I Q for the neurotics, and between 82 and 99 I Q for the normals. The same number of each group fall below 96 I Q; 66 per cent of each group. Fifty-eight per cent or 29 out of 50 neurotics fall below their mean I Q, while 48 per cent or 24 reach the mean I Q of the normals. Forty-four per cent or 22 out of 50 normals fall below their mean I Q, while 54 per cent or 27 reach the mean I Q of the neurotics. Pair for pair, 24 neurotics had higher I Q's than their normal mates, 23 normals had higher I Q's than

their neurotic mates, and three pairs were found to measure the same.

These comparisons and overlappings lead to the conclusion that the rating of intelligence by the Stanford Binet Test does not enlighten us in arriving at the differences between the neurotics and their non-neurotic mates. A comparison, however, of the distribution of intelligence of these two groups with the group of 905 unselected children discussed by Terman [53, p. 66] furnishes significant results.

TABLE VI

DISTRIBUTION OF IQ'S OF THE NEUROTIC GROUP, THE NON-NEUROTIC GROUP, AND TERMAN'S 905 UNSELECTED CHILDREN

	Terman	Neurotic	Normal
Lower Quartile	56–93	68–82.5	58– 82
Middle 50 Per Cent	93–108	82.5–100	82– 99
Upper Quartile	108–145	100–130	99–113
Below 96 IQ	31%	66%	66%
Between 96–105 IQ	34%	22%	28%
Above 106 IQ	35%	12%	6%

Upon comparing the middle 50 per cent of these groups, it is apparent that the neurotic group, instead of matching with this unselected group, matches with a sample which is below par. The middle 50 per cent of the Terman group lies between 93 and 108 I Q, that of the neurotic group lies between 82.5 and 100 I Q, and that of the normal group lies between practically the same limits, 82 to 99 I Q. And whereas less than one third of Terman's unselected group falls below 96 I Q, two-thirds of the neurotics and their mates fall below 96 I Q.

These comparisons lead to the conclusion that there is a rather distinct tendency to stupidity among the neurotic children studied. As Hollingworth [24, p. 70] has pointed out, though unstable children may come from any part of the curve of intelligence, more unstable children come from the lower end of the curve than elsewhere.

ANALYSIS OF STANFORD BINET TEST ITEMS AT EACH AGE LEVEL

A count was made of each Stanford test item passed and failed by each individual at the various age levels. Perhaps

some types of tests would thus show themselves to be relatively harder for one group than for the other.

YEAR 5

	FAILURES						SUCCESSES						No.
	Test Item						Test Item						
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	0	0	0	0	0	0	1	1	1	1	1	1	1
Normal	0	0	0	0	0	0	3	3	3	3	3	3	3

The analysis reads: 1 neurotic individual had a range including year 5. He failed none of the tests for that year. Three normals had a range including year 5; they failed none of the tests for that year.

YEAR 6

	FAILURES						SUCCESSES						No.
	Test Item						Test Item						
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	0	1	0	0	0	0	5	4	5	5	5	5	5
Normal	0	1	0	0	0	2	6	5	6	6	6	4	6

The analysis reads: 5 neurotic children had a range including year 6. Of these 5, there was but one failure, in test 2, with successes in all the other items. Six normal children had a range including year 6. Of these 6, one failed test 2, 2 failed test 6, none failed the other items.

This explanation will suffice for the remaining analyses.

YEAR 7

	FAILURES						SUCCESSES						No.
	Test Item						Test Item						
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	0	0	1	3	0	1	24	24	23	21	24	23	24
Normal	0	4	1	2	3	3	25	21	24	23	22	22	25

YEAR 8

	FAILURES						SUCCESSES						No.
	Test Item						Test Item						
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	22	3	6	8	1	8	5	24	21	19	26	19	27
Normal	21	0	7	10	3	6	5	26	19	16	23	20	26

YEAR 9

	Test Item						Test Item						No.
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	0	6	0	12	6	2	34	28	34	22	28	32	34
Normal	1	10	4	12	4	5	36	27	33	25	33	32	37

YEAR 10

	Test Item						Test Item						No.
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	25	13	16	10	15	9	18	30	27	33	28	34	43
Normal	30	14	18	7	17	19	15	31	27	38	28	26	45

YEAR 12

	Test Item								Test Item								No.
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
Neurotic	26	12	20	26	16	14	20	21	12	26	18	12	22	24	18	17	38
Normal	27	15	18	27	22	22	14	22	10	22	19	10	15	15	23	15	37

YEAR 14

	Test Item						Test Item						No.
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	22	9	16	15	17	20	2	15	8	9	7	4	24
Normal	20	9	14	15	13	12	3	14	9	8	10	11	23

YEAR 16

	FAILURES						SUCCESSES						
	Test Item						Test Item						No.
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	17	7	17	13	8	17	1	11	1	5	10	1	18
Normal	15	8	13	13	11	14	0	7	2	2	4	1	15

YEAR 18

	Test Item						Test Item						No.
	1	2	3	4	5	6	1	2	3	4	5	6	
Neurotic	10	7	4	9	5	10	0	3	6	1	5	0	10
Normal	4	2	4	4	4	4	0	2	0	0	0	0	4

This analysis reveals no significant differences nor any consistency of successes and failures that could lead to conclusions. The two levels of picture description are used as an example of this lack of consistency.

YEAR 7. Test 2

	Failures	Successes	Total
Neurotics	0– 0%	24–100%	24
Normals	4–16%	21– 84%	25

This analysis reads: Of the 24 neurotics who performed test 2 of year 7, there were 100 per cent successes. Of the 25 normals, 4 failed and 21 succeeded,—that is, there were 16 per cent failures, and 84 per cent successes.

YEAR 12. Test 7.

	Failures	Successes	Total
Neurotics	20–53%	18–47%	38
Normals	14–38%	23–62%	37

This analysis reads: Of the 38 neurotics who performed test 7 of year 12, 20 failed and 18 succeeded,—that is, there were 53 per cent failures, and 47 per cent successes. Of the 37 normals, 14, or 38 per cent, failed and 23, or 62 per cent, succeeded.

The normals take the lead in the 12 year level which the neurotics had in the 7 year level. The biggest differences occurred in the following proportions in the following tests:

YEAR 10. Test 6: Naming Sixty Words.

	Failures	Successes	Total
Neurotics	9–20.9%	34–79.1%	43
Normals	19–42.2%	26–57.8%	45

YEAR 12. Test 5: Interpretation of Fables.

	Failures	Successes	Total
Neurotics	16–42.1%	22–57.9%	38
Normals	22–59.5%	15–40.5%	37

YEAR 12. Test 6: Repeating 5 Digits Backwards.

	Failures	Successes	Total
Neurotics	14–36.8%	24–63.2%	38
Normals	22–59.5%	15–40.5%	37

YEAR 12. Test 7: Interpretation of Pictures.

	Failures	Successes	Total
Neurotics	20–52.6%	18–47.4%	38
Normals	14–37.8%	23–62.2%	37

YEAR 14. Test 6: Reversing Hands of Clock.

	Failures	Successes	Total
Neurotics	20–83.3%	4–16.7%	24
Normals	12–52.2%	11–47.8%	23

YEAR 16. Test 5: Repeating 6 Digits Backwards.

	Failures	Successes	Total
Neurotics	8–44.4%	10–55.6%	18
Normals	11–73.3%	4–26.7%	15

The above analyses were compared with the statements made by Mateer [30, p. 177]: "Perhaps the only points on which there are sufficient data to give us any generalization are first: That psychotics are relatively good in rote memory, comprehension, absurdities (?) and use of abstract terms." (By *psychotic* is meant the individual with disturbance of intelligence functioning, apart from intelligence level.)

ROTE MEMORY

YEAR 6. Test 6: Repeat 16–18 Syllables.

	Failures	Successes	Total
Neurotics	0– 0%	5–100%	5
Normals	2–33⅓%	4– 66⅔%	6

The number of children who took the 6-year tests is too small to enable us to draw any conclusions, but it is seen that results from our neurotic and normal group agree with the findings of Mateer that the psychotics are "relatively good."

YEAR 7. Test 3: Repeat 5 Digits.

	Failures	Successes	Total
Neurotics	1–4.2%	23–95.8%	24
Normals	1–4%	24–96%	25

Here we see that the two groups are the same.

YEAR 9. Test 4: Repeat 4 Digits Backwards.

	Failures	Successes	Total
Neurotics	12–35.3%	22–64.7%	34
Normals	12–32.4%	25–67.6%	37

The neurotic group is slightly lower in this comparison.

YEAR 12. Test 6: Repeat 5 Digits Backwards.

	Failures	Successes	Total
Neurotics	14–36.8%	24–63.2%	38
Normals	22–59.5%	15–40.5%	37

The neurotic and normal group on this test are in harmony with Mateer that psychotics are "relatively good."

YEAR 16. Test 5: Repeat 6 Digits Backwards.

	Failures	Successes	Total
Neurotics	8–44.4%	10–55.6%	18
Normals	11–73.3%	4–26.7%	15

Again agreement.

YEAR 18. Test 3: Repeat 8 Digits.

	Failures	Successes	Total
Neurotics	4– 40%	6–60%	10
Normals	4–100%	0– 0%	4

Agreement.

YEAR 18. Test 5: Repeat 7 Digits Backwards.

	Failures	Successes	Total
Neurotics	5– 50%	5–50%	10
Normals	4–100%	0– 0%	4

Agreement.

COMPREHENSION

YEAR 6. Test 4: Comprehension Second Degree.

	Failures	Successes	Total
Neurotics	0–0%	5–100%	5
Normals	0–0%	6–100%	6

Again, we are dealing with very small numbers, but the two groups are the same.

YEAR 8. Test 3: Comprehension Third Degree.

	Failures	Successes	Total
Neurotics	6–22.2%	21–77.8%	27
Normals	7–26.9%	19–73.1%	26

The neurotic group is slightly better.

YEAR 10. Test 5: Comprehension Fourth Degree.

	Failures	Successes	Total
Neurotics	15–34.9%	28–65.1%	43
Normals	17–37.8%	28–62.2%	45

The two groups are almost the same, the neurotics having a slight lead.

ABSURDITIES

Mateer follows this item with a (?).

YEAR 10. Test 2: Absurdities.

	Failures	Successes	Total
Neurotics	13–30.2%	30–69.8%	43
Normals	14–31.1%	31–68.9%	45

Practically the same.

USE OF ABSTRACT TERMS

YEAR 12. Test 2: Abstract Words.

	Failures	Successes	Total
Neurotics	12–31.6%	26–68.4%	38
Normals	15–40.5%	22–59.5%	37

Agreement.

YEAR 16. Test 3: Difference Between Abstract Words.

	Failures	Successes	Total
Neurotics	17–94.4%	1– 5.6%	18
Normals	13–86.7%	2–13.3%	15

As opposed to the above findings, the normals have here a slight lead.

The second part of Mateer's statement of generalization is "that psychotics are definitely poor in memorial content, as on reading reports and in reproducing designs."

YEAR 10. Test 4: Reading and Report.

	Failures	Successes	Total
Neurotics	10–23.3%	33–76.7%	43
Normals	7–15.6%	38–84.4%	45

Agreement.

YEAR 10. Test 3: Designs.

	Failures	Successes	Total
Neurotics	16–37.2%	27–62.8%	43
Normals	18–40%	27–60%	45

Lack of agreement; neurotics are slightly better.

The third part of Mateer's statement of generalization is that "psychotics are relatively poor in rhymes, reaction time and sixty words, the weights, constructing sentences from three words, solving enclosed boxes."

YEAR 9. Test 6: Rhymes.

	Failures	Successes	Total
Neurotics	2– 5.9%	32–94.1%	34
Normals	5–13.5%	32–86.5%	37

Lack of agreement; neurotics are slightly better.

YEAR 10. Test 6: Naming Sixty Words.

	Failures	Successes	Total
Neurotics	9–20.9%	34–79.1%	43
Normals	19–42.2%	26–57.8%	45

Lack of agreement; neurotics are much better.

YEAR 9. Test 2: Weights.

	Failures	Successes	Total
Neurotics	6–17.6%	28–82.4%	34
Normals	10–27%	27–73%	37

Lack of agreement; neurotics are somewhat better.

YEAR 9. Test 5: Three Words in a Sentence.

	Failures	Successes	Total
Neurotics	6–17.6%	28–82.4%	34
Normals	4–10.8%	33–89.2%	37

Agreement; neurotics are slightly poorer.

YEAR 16. Test 4: Enclosed Boxes.

	Failures	Successes	Total
Neurotics	13–72.2%	5–27.8%	18
Normals	13–86.7%	2–13.3%	15

Lack of agreement; neurotics are slightly better.

In the comparison of these 20 test items, there are ten cases in which the results of this study agree and ten cases in which the results do not agree with the findings of Mateer.

This mass of conflicting evidence, as well as the great amount of overlapping, leads one to believe that neurotics and normals are not differentiated by failures and successes on the various Stanford tests.

SCATTERING OR AMOUNT OF VARIABILITY ON THE STANFORD BINET

Investigators vary in their conclusions concerning this subject of scatter.

As Mateer explains [30, p. 70]: "The amount of variability on the Stanford Binet is measured by the number of years above the basal year in which a child scores successes. For example, if a child has a basal year of 8 and succeeds in some tests in 9 and 10 and does one other test in the 14-year group, his *range* is 14 years minus 8, or 6. . . . The whole matter is tentative, but we may tentatively try out the presence of more than four years of variability above the basal as a definite indication of instability or variability which is more than that of the group as an average."

Terman [53, p. 134] has this to say concerning scattering of successes: "Why, it may be asked, should not a child who has ten-year intelligence answer correctly all the tests up to and including group X, and fail on all the tests beyond? There are two reasons why such is almost never the case. In the first place, the intelligence of an individual is ordinarily not even. There are many different kinds of intelligence, and in some of these, the subject is better endowed than in others. A second reason lies in the fact that no test can be purely and simply a test of native intelligence. Given a certain degree of intelligence, accidents of experience and training bring it about that this

intelligence will work more successfully with some kinds of material than with others. For both of these reasons there results a scattering of successes and failures over three or four years."

Irwin and Marks [25, p. 187] give as indicative of the neurotic type of child the fact that he is likely to make a scattering test.

Wallin [64, p. 151] concludes from his data: "Individuals of all types are found who scatter very greatly and who scatter very little. The significance of little or much scattering has not yet been made clear by studies which have thus far appeared."

Taylor [51, p. 31] suggests also that irregularity is not a diagnostic factor: "It will be seen that the feeble-minded are not any more irregular in respect to irregularity than other groups of children."

Mathews [32] summarizes her study of two hundred delinquent boys and one hundred delinquent girls with the statement that the data give no definite clue as to what are the specific factors which make for greater scattering; many unstable, neurotic, or psychopathic individuals give very even tests.

Doll [15, p. 96] says: "Clinicians have discovered empirically that mental defectives scatter more than normals in Binet-Simon Tests. A feeble-minded child obtains his points of credit from a greater range of tests than does a normal child of the same intelligence, that is, he scatters more."

Opposed to his findings are Wallin's, that normal pupils scatter most, imbeciles least.

Mathews says of her study that a comparison of I Q's with irregularity shows rather stronger tendency than has yet been found toward greater scattering among the higher I Q's.

Pressey's data [41] show about the same irregularity for I Q's ranging from 76 to 125, and a greater irregularity above 125, but there are large individual differences. His conclusion is that irregularity is not distinctive of subnormality, but that great irregularity indicates the presence in the examination of some more or less irrelevant factor, such as very unusual education or environment, marked sensory defect, poor coöperation; and that irregularity may be said to give a measure of the reliability of an examination, of its freedom from such factors.

Comparisons follow of the scatter or range of years covered on the Stanford Binet Test by the neurotic and normal groups, and a tabulation of the I Q's that fall in each range of years.

TABLE VII

AMOUNTS OF SCATTER OF NEUROTIC AND NORMAL GROUPS ON STANFORD BINET TEST

Neurotics who scatter more than 4 years	26
Normals who scatter more than 4 years	26
Neurotics who scatter less than 4 years	13
Normals who scatter less than 4 years	14
Neurotics who scatter 4 years	11
Normals who scatter 4 years	10
No. of years average scatter of neurotics	5.14
No. of years average scatter of normals	4.82

Neurotics scattered 0.32 year more than the normal group.

TABLE VIII

COMPARISON OF IQ'S AND SCATTER

	No. of Children	No. of Years Scatter	Range of IQ
Neurotic	1	1	88
Normal	1	1	89
Neurotic	3	2	86– 88
Normal	3	2	89–103
Neurotic	9	3	74– 98
Normal	10	3	65–102
Neurotic	11	4	75–130
Normal	10	4	75–108
Neurotic	8	5	68–105
Normal	13	5	58–103
Neurotic	6	6	81–122
Normal	4	6	93–113
Neurotic	2	7	92–102
Normal	3	7	84– 98
Neurotic	3	8	101–116
Normal	0	8	
Neurotic	6	9	86–124
Normal	6	9	82–100
Neurotic	1	11	98
Normal	0	11	

SUMMARY OF TABLE VIII

SCATTER OF 4 YEARS AND LESS

	Neurotic	Normal
Below 80 IQ	4	5
Above 90 IQ	8	16

SCATTER OF 5 YEARS AND MORE

	Neurotic	Normal
Below 80 IQ	3	5
Above 90 IQ	16	12

Average scatter of 10 lowest neurotics (66-80 IQ)	4.0 years
Average scatter of 10 lowest normals (58-79 IQ)	4.1 years
Average scatter of 10 highest neurotics (102-130 IQ)	6.8 years
Average scatter of 10 highest normals (100-113 IQ)	4.4 years

This overlapping of neurotics and normals and of low and high I Q's in the various amounts of scatter makes us hesitate to assign significance to the amount of variability or scatter on the Stanford Binet.

STANFORD BINET RETEST

A second Stanford Binet was given for data on the question: "Does the I Q of neurotics vary more on a retest than the I Q of normals?" An interval of two weeks was determined upon as one allowing enough time to elapse for forgetting the tests and allowing no significant time for mental growth to occur to complicate results.

The constancy of the I Q has been a subject for frequent discussion. Terman [52, p. 141], Poull [39, p. 324], Rugg and Colloton [47, p. 316] report an average difference in I Q between first test and the second test of approximately five points I Q.

Literature on the subject has many references to fluctuation of I Q and variability of performance by virtue of the attitude and mood of the subject.

Sullivan [49, p. 18] gives us her conclusion: "The conspicuous feature of this investigation is the low coefficients that result from correlating measures of mood with tests of performance."

Bronner [8] cites cases in which the level of performance was definitely lowered by the presence of certain factors in the attitude of the subjects, for example: (1) Deliberate deception;

(2) recalcitrancy; (3) sportiveness; (4) emotional disturbance: (*a*) general depression, (*b*) anger or resentfulness, (*c*) fear, (*d*) general nervous excitement, etc.

Blanchard [5, p. 374] cautions against accepting the I Q at its face value: "The most numerous class in which a fluctuation of the I Q is to be observed, is the group which for want of a better term is often designated by the psychiatrist as psychic 'constitutional inferiority.' Individuals of this type are also characterized as neurotic or emotionally unstable. . . . It is only through long (and sometimes sad) experience with these unstable types that we come to realize that their intellectual efficiency varies with their mood."

Irwin and Marks [25, p. 187] give results of changes on retests of a normal group of 322 and a neurotic group of 30, following their statement that the neurotic type of child is likely to change his total rating on a retest. Twenty-seven per cent of the Irwin neurotic group varied within 3 points above or below versus 49 per cent of the Irwin normal. Forty-seven per cent of the Irwin neurotic group varied within 6 points above or below versus 77 per cent of the Irwin normal.

Similar analysis of the retests of the two groups here studied does not reveal this greater change of the neurotic group. Sixty-four per cent of the neurotic group varied within 3 points above or below versus 60 per cent of the normal. Ninety-two per cent of the neurotic group varied within 6 points above or below versus 84 per cent of the normal.

TABLE IX

Results of Stanford Binet Retests

	Neurotic	Normal
IQ_1	92.3 ± 1.33	89.5 ± 1.19
IQ_2	93.5 ± 1.29	93 ± 1.27
S. D. of IQ_1	13.94	12.44
S. D. of IQ_2	13.52	13.34
S. D. Difference	2.74	2.58
No. of Plus Changes	26	34
Average of the Plus Changes	4.12	4.07
No. of Minus Changes	15	15
Average of the Minus Changes	2.09	2.85
No. of Zero Changes	9	1
Average of the Differences between IQ_1 and IQ_2	2.77	3.62

Lincoln [27, p. 495] cites instances of changes in I Q recorded by retests, and remarks that discrepancies do not lessen the value of the I Q but increase its usefulness, provided that a scientific case-study of the individual be made.

The results of retesting the fifty pairs of this study appear in Table IX.

The average difference in I Q between the test and retest of both the neurotic and normal children then is a little less than that found by other investigators for various groups; a difference of 2.77 points I Q between the neurotics' first and second test, a difference of 3.62 points I Q between the normals' first and second test, versus approximately 5 points difference between the first and second tests in various other studies.

In the case of these fifty pairs of children, there are nine neurotics whose I Q's show no change on a retest versus only one normal who shows no change.

What do we find from an examination of failures and successes made on the retest that were not so performed on the first test?

Mateer [30, p. 149] says: "It is rather uncommon, but no rare thing to find an unstable child who will score the same mental age after a brief interval of a week or two, but whose test results are gained by success on a very different group of tests and who fails on many tests done previously."

Of the nine neurotic children aforementioned who earned the same mental age on both tests, four scored exactly the same failures and successes on both tests. The remaining five in this neurotic group showed different failures and successes on the tests as follow:

Failures: 1 2 2 1 2 *Successes:* 2 2 2 1 1

(Where successes and failures do not cancel, the same mental age was earned, as different tests are worth varying "amounts" of mental age.) These results then do not give this finding of Mateer; there was no unstable child gaining the same mental age on the retest by a very different group of successes and failures.

The average improvement in mental age in the second tests over the first is 2.9 months for the neurotic group and 4 months for the normal group.

Thorndike [59, p. 29] says, concerning such improvement: "Improvement is made in score quite innocently in a second trial though the individual has never thought of the test in the meantime by reason of the general familiarity with the tasks, adaptation to them, and whatever other special advantages a preliminary trial gives. In the Binet this averages about three months of mental age."

These improvements of 2.9 months and 4 months, then, are not to be interpreted as significant. Because of this and because the difference between the neurotic and normal changes on the retests is practically negligible, we cannot look for any diagnostic aid from a Stanford Binet retest for our problem of differentiation of normal and neurotic children.

PINTNER EDUCATIONAL SURVEY TEST

Neurotic children are frequently described as being deficient in their school achievement.

Burt [12, p. 71] says: "Their school work is backward,—it calls for qualities they lack. Arithmetic is worst. Reading is fluent and expressive, but full of guess work and inaccuracy."

Hollingworth [24, p. 70] enumerates those qualities which neurotics characteristically lack as an ordinary degree of coöperation, adherence to definite directions, power of sustained effort, and fidelity to bare facts, and further confirms Burt's statements: "General nervous instability naturally tends to failure in any school subject which demands the qualities of

TABLE X

PINTNER EDUCATIONAL TEST RESULTS

	Neurotic	Normal
Educational Score	41.9 ± 1.88	41.7 ± 1.84
S. D.	19.75	19.32
S. D. Difference	3.91	3.91
Educational Index	44.23	44.04
Arithmetic	15.36	16.6
Reading (1)	4.96	4.64
Reading (2)	5.66	5.44
Average of Readings	5.31	5.04
Geography	3.82	4.04
History	4.62	3.96
Grammar	1.76	1.82

character mentioned above. . . . Thus nervous, but intelligent, children may be deficient in reading, spelling, and arithmetic, 'the tool subjects,' while making satisfactory progress in 'the subject matter courses,' such as history, nature study, or geography, where precise connections in prescribed sequences of relationships need not be formed, in order to succeed."

The experimenter, having in mind the authority back of these statements, almost hesitates to present the results of the 50 pairs herein studied.

In explanation of the fourth item, Educational Index, Pintner says: "This tells how well the child did in the educational tests as compared with children of the same age. Indices run from 0 to 100. They are so arranged that each step on this scale is about equal in difficulty.

Indices	Percentages
0–19	2.2
20–39	22.8
40–59	50.0
60–79	22.8
80-100	2.2

"If a child has an educational index between 40 and 59, we say he is doing average educational work for his age, or, in other words, he belongs among the middle 50 per cent of children of that age."

A comparison of these average test scores fails to reveal a difference between the two groups. The educational scores of 41 and 42 are grouped together by Pintner in assigning educational indices for ages 11 and 12. (The average chronological age of these children is 11 years 10 months.) So we can hardly differentiate between 41.9 and 41.7, the scores, respectively, of the neurotic and normal groups! The slight differences present favor neurotics in the tests of reading and history, and normals in the tests of arithmetic, grammar, and geography.

To ascertain whether those who were above average mentally were also above average educationally, and whether there were any real differences here between the neurotics and the normals, the two groups were each subdivided into those individuals who had I Q's above the average of their group, and into those individuals who had I Q's below the average of their group, with their respective educational indices.

Of the 21 neurotics with I Q *above* their group average, 18 or 85.7 per cent have educational indices *above* their group average.

Of the 29 neurotics with I Q *below* their group average, 24 or 82.8 per cent have educational indices *below* their group average.

Of the 28 normals with I Q *above* their group average, 23 or 82.1 per cent have educational indices *above* their group average. And of the 22 normals with I Q *below* their group average, 17 or 77.3 per cent have educational indices *below* their group average.

To get at this same point, the mental ages and educational scores were correlated by the Pearson Product-Moment Method, viz., for neurotics, $r = .849$; for normals, $r = .86$.

Evidently for these particular neurotic children, possession of neurotic traits did not prevent them from achieving the same educational status as their normal mates. So far as this educational test is concerned, neurotics can be matched against a group of normals without finding any differences in the respects investigated. It must be pointed out, however, that by taking the controls from the same grade in school as the neurotics with whom they were paired, the question of comparing the school achievement of neurotic children with that of normal children in general is begged.

A comparison of the educational indices of the neurotic group and their non-neurotic mates with the par sample given by Pintner shows that the two groups being studied compare unfavorably.

TABLE XI

Educational Indices of Middle Fifty Per Cent

Neurotic	37.1–50.8
Normal	37.5–51.2
Par Sample	40.0–59.0

As previously explained, the middle 50 per cent of unselected children have educational indices between 40 and 59. The middle 50 per cent of the neurotic and the normal groups have educational indices between 37 and 51. The neurotics, in the case of educational achievement as in the case of intelligence, do not match with a par sample, but match with a sample which is below par.

AGE-GRADE STATUS

Thus no inference is to be drawn as to the comparison of the school achievement of neurotic and normal children in general. Even though many studies have been made showing the wide overlapping of abilities in different grades, and the great differences in ability within the same grade, the fact remains that the range of ability is cut off at both the lower and upper ends in each grade. And so by using "grade in school" as one of the constant factors, the educational achievement of the controls was somewhat fixed and determined by the manner of their selection. Thus, it might be significant to compare the age-grade status of neurotic with unselected school children. The age-grade distribution of fifty additional neurotic children was secured and combined with the fifty already studied. The age-grade status of these one hundred was then compared with that of the white elementary schools of Baltimore for 1922. The comparison is shown in Table XII.

TABLE XII

COMPARATIVE TABLE OF AGE-GRADE STATUS

Group	Per Cent Under-Age.	Per Cent Normal Age*	Per Cent Over-Age
100 Neurotic Pupils	0	55.0	45.0
Baltimore Elementary Schools	2.8	61.8	35.4

* Explanation of "Normal Age" [48, Vol. II, p. 155]:
"If a child enters public school at six years of age, or before he is seven and makes normal progress [in other words, makes one grade each year], he may be said to be of normal age."

From Table XII, it is read that none of the neurotic children are below the normal ages for their respective grades,—that is, none are under-age, whereas 2.8 per cent of the children of the Baltimore white elementary schools are under-age for their grades. Fewer neurotic children are normal age for their grades; 6.8 per cent fewer than unselected school children. More neurotic children, then, are over-age for their grades; 9.6 per cent more than unselected school children.

It might also be significant to compare the number of years of "over-ageness" of the two groups. This is shown in Table XIII.

TABLE XIII

ANALYSIS OF OVER-AGE PERCENTAGES

Group	Per Cent 1 Year Over-Age	Per Cent 2 Years Over-Age	Per Cent 3 Years Over-Age	Per Cent Above 3 Years Over-Age
100 Neurotic Pupils	29.0	12.0	4.0	0
Baltimore Elementary Schools	20.0	9.6	3.9	1.9

From this table, it is read that there were no neurotic pupils more than 3 years over-age. The percentage of pupils who are 3 years over-age is almost the same for the two groups. A larger percentage of neurotics are 1 year over-age.

Several explanations for these facts suggest themselves:

1. Neurotic pupils may withdraw from school sooner than unselected children.
2. Late school entrance may be more common among neurotic children, thereby increasing the percentage of those who are one or two years over-age.
3. Neurotic children may present particularly difficult problems to teachers, and though misfits, are promoted to a higher grade.

This comparison of over-age pupils is actually more significant than appears on the surface, for the 35.4 per cent over-age for unselected children includes all neurotics. Non-neurotics by themselves would probably show less than 35.4 per cent of over-age pupils. Neurotic school children then as compared with unselected school children are in a lower school grade.

The data from the Pintner Educational Tests show only that there exist non-neurotic children who do not differ in their educational test performance from children of the same age, grade, race and sex, who were diagnosed as neurotic.

PINTNER-PATERSON PERFORMANCE TESTS

Will performance tests which penalize impulsive response, careless and awkward moves, impatience, lack of sustained effort,—all traits commonly attributed to neurotics,—reveal any differentiating characteristics?

The averages follow for each of the ten performance tests of the Pintner-Paterson Short Performance Scale.

TEST I. MARE AND FOAL

Group	Seconds	Mental Age	Errors	Mental Age
Neurotic	42.45	9	2.26	9.5
Normal	43.44	9	2.6	7

A score of 39–44 seconds receives a mental age of 9.
A score of 2 errors receives a mental age of 9.5.
A score of 3 errors receives a mental age of 7.

TEST II. SEGUIN FORM BOARD

Group	Trial 1	Mental Age	Trial 3	Mental Age
Neurotic	32.1	5	22.44	7
Normal	31.86	5	22.46	7

A score of 32–50 seconds receives a mental age of 5.
A score of 22–24 seconds receives a mental age of 7.

The Seguin Form Board affords a learning test, inasmuch as three trials are allowed, and the time of the shortest trial is taken as the score. Results indicate that neurotics on the average gain about as much from practice as do normals. The neurotics' score for the first trial was 32.1 seconds and for the third trial, 22.44 seconds; the normals' score for the first trial was 31.86 seconds and for the third trial 22.46 seconds. An individual count, however, shows that more neurotics than normals failed to show improvement in the third trial over the first or second, though it is probably no real difference.

Neurotics whose 3rd trial took more time than 1st	2
Normals whose 3rd trial took more time than 1st	0
Neurotics whose 3rd trial took more time than 2nd	14
Normals whose 3rd trial took more time than 2nd	11
Neurotics whose 3rd trial took same time as 1st	1
Normals whose 3rd trial took same time as 1st	0

Neurotics whose 3rd trial took same time as 2nd 5
Normals whose 3rd trial took same time as 2nd 3

Neurotics whose 3rd trial showed no improvement over 2nd and 1st .. 3
Normals whose 3rd trial showed no improvement over 2nd and 1st .. 0

TEST III. FIVE FIGURE BOARD

Group	Seconds	Mental Age	Errors	Mental Age	Incomplete
Neurotic	94.08	8	6.15	8	4
Normal	82.72	9	5.72	8	3

A score of 88–106 seconds receives a mental age of 8.
A score of 74– 87 seconds receives a mental age of 9.
A score of 6 errors receives a mental age of 8.

TEST IV. TWO FIGURE BOARD

Group	Seconds	Mental Age	Moves	Mental Age	Incomplete
Neurotic	79.71	8	20.04	7	3
Normal	83.68	8	17.87	7	3

A score of 56–88 seconds receives a mental age of 8.
A score of 18–22 moves receives a mental age of 7.

TEST V. CASUIST FORM BOARD

Group	Seconds	Mental Age	Errors	Mental Age	Incomplete
Neurotic	113.24	8	7.91	8	5
Normal	101.86	8	7.95	8	6

A score of 100–129 seconds receives a mental age of 8.
A score of 8–10 errors receives a mental age of 8.

TEST VI. MANIKIN TEST

Group	Score	Mental Age
Neurotic	3.52	7
Normal	3.30	6

A score of 3 receives a mental age of 6.
A score of 4 receives a mental age of 7.

TEST VII. FEATURE PROFILE

Group	Seconds	Mental Age
Neurotic	114.8	15 +
Normal	119.04	15 +

A score of 127 seconds receives a mental age of 15. The test is not scored beyond that.

TEST VIII. SHIP TEST

Group	Score	Mental Age
Neurotic	16.52	8
Normal	14.84	6

A score of 11–15 receives a mental age of 6.
A score of 17 receives a mental age of 8.

TEST IX. PICTURE COMPLETION

Group	Score	Mental Age
Neurotic	317	8
Normal	386	9

A score of 285–368 receives a mental age of 8.
A score of 369–421 receives a mental age of 9.

TEST X. CUBE TEST

Group	Score	Mental Age
Neurotic	6.32	9
Normal	6.54	12

A score of 6 correct receives a mental age of 9.
A score of 7 correct receives a mental age of 12.

Neurotic: Median mental age on all Performance Tests: 9.15
Normal: Median mental age on all Performance Tests: 9.42

A count of the fourteen individual mental ages yielded by the Pintner-Paterson Short Performance Scale shows that the neurotic group received the same mental age as the normal in eight cases, was higher in three cases and lower in three cases. This equality, as well as the small difference of 0.27 year between the median mental ages, leads us to modify the general statement that neurotics are careless, inaccurate, impulsive, and impatient, and to suggest rather that in particular situations such behavior may be the response. And in the present experiment, performance tests did not create such a situation. Or at any rate performance tests do not present a situation that elicits responses peculiar to one group or differentiating one group from another.

COMPARISON OF MENTAL AGE SCORES ON PERFORMANCE SCALE WITH STANFORD BINET

Some investigators have suggested that a discrepancy between scores on the Stanford-Binet and scores on Performance Tests indicates neurotic traits.

Comparisons of the neurotic and normal groups are as follows:

Neurotics with higher mental age on Performance than on Stanford.... 9
Normals with higher mental age on Performance than on Stanford.... 18

Neurotics with lower mental age on Performance than on Stanford.... 34
Normals with lower mental age on Performance than on Stanford.... 32

Neurotics with same mental age on Performance as on Stanford.... 7
Normals with same mental age on Performance as on Stanford.... 0

This comparison shows that twice as many normals as neurotics earned a higher Performance mental age than a Stanford mental age; that no normals earned the same mental age on both, while seven neurotics rated the same on the two scales. There is probably no diagnostic significance to be attached to different ratings on the two scales.

HANDWRITING TEST

"The handwriting of neurotics," says Burt [12, p. 71], "is irregular and untidy; they scribble at high speed."

Samples of handwriting were secured from 40 neurotics and their normal mates. The sentence written was: "The quick

brown fox jumps over the lazy dog." The procedure was as follows: The children were told that samples of different children's handwriting were wanted. Each individual was given a blank slip of paper and a slip with the sentence written upon it, and was instructed to write this sentence after it was read aloud. After each child had completed writing the sentence, the first slip was collected, a fresh sheet of paper was given, each child keeping his own copy in front of him. The experimenter then said: "Write your name on the paper. I want you to start writing this sentence when I say 'Begin,' and then keep writing it until I say 'Stop'. Write the way you always do, not your best, nor your fastest, just your regular writing. 'Begin.'" After three minutes the papers were collected.

The quality of the handwriting was judged by Thorndike's scale and the speed judged as the number of letters written per minute, average of the three-minute period. The experimenter and another person each judged each of the samples three times, and the score is the average of these judgments.

TABLE XIV

Comparison of Handwriting Ability

Group	Quality	Speed
Neurotic	7.75	64.66
Normal	8.01	66.93

A score for general writing ability which combines the two factors of quality and speed was found by means of the formula developed by Gates [18, p. 131]:

$$\text{Combined score} = \text{quality} \times \sqrt[3]{\text{speed}}$$

This formula shows that the two scores are almost the same. Neurotic, 31.125; normal, 32.521.

A speed of 64 letters per minute and a quality of 9.3 is given by Thorndike [57] as the median for the fifth grade at the middle of the second half year. The fifth grade is the median grade location of the group here studied. So, as compared with a par sample, the neurotics are equal in speed, but their quality is equivalent to that expected of a third grade. Thus the hand-

CROSS-OUT TESTS

writing of neurotics is "not poor" only in comparison with a group which itself is not up to par.

Four Cross-Out Tests dealing with different kinds of material were given to ascertain whether such tasks would reveal the differentiating characteristics of neurotics described by Burt [12, p. 71] as "working by fits and starts where interest is caught, becoming easily fatigued, being careless and inaccurate."

Test 1 deals with designs; Test 2, with numbers; Test 3, with words; and Test 4, with nonsense-words. In each test the directions are the same: "Look at each pair (of objects, of numbers, of words) shown below. Make a cross after each pair where the two (objects, numbers, words) are not alike." The number of minutes for each test was one, three, one, two, respectively.

TABLE XV

COMPARISON OF CANCELLATION TESTS

TEST I

Group	Attempts	Number of Rights
Neurotic	10.8	9.88
Normal	9.35	8.75

TEST II

Group	Attempts	Number of Rights
Neurotic	10.48	10.03
Normal	10.55	9.6

TEST III

Group	Attempts	Number of Rights
Neurotic	16.63	16.53
Normal	16.23	16.1

TEST IV

Group	Attempts	Number of Rights
Neurotic	17.4	17.1
Normal	17.7	17.35

A consideration of these averages shows that the neurotic group made a greater number of attempts in two tests, and had a greater number of rights in three tests.

The short time allowed for each test may have precluded the onset of fatigue or the fading of interest. Again,—what the data show is that the two groups are not differentiated by the criteria here employed.

CHAPTER IV

DISCUSSION OF FINDINGS AND CONCLUSIONS

The purpose of this study was to compare the intellectual and educational status of a group of school children diagnosed by psychiatric authority as neurotic, with an equal number of non-neurotic school children of the same grade, age, sex and race, by means of specific tests,—the Stanford-Binet, the Pintner-Paterson Short Performance Scale, the Pintner Educational Survey, Handwriting, and Cancelation Tests.

None of these tests proved diagnostic of the condition which psychiatrists call "neurotic." Non-neurotic children exist who are indistinguishable from neurotics in the performances studied.

It is a significant fact, however, that the samplings of non-neurotic children who were accumulated for pairing with the group of neurotic children are retarded in age-grade status and are below par in intelligence.

Selection of the non-neurotic mates with the factors of age and grade as constants ensured the same age-grade status in both groups. Comparison with a total school population revealed that the neurotics were retarded in age-grade status,—there were 9.6 per cent more over-age pupils in the neurotic group than there were in the total school population. Also, there were no under-age pupils in the neurotic group, while the total school population showed 2.8 per cent pupils under age for their grades.

In the case of the distribution of intelligence, the neurotics did not differ from their normal mates, but when compared with Terman's unselected group of 905 children, the same distribution did not hold. The middle 50 per cent of the neurotic group lies within lower limits than that of the unselected group; 82.5-100 I Q is the quartile deviation of the neurotics; 93-108 I Q, the quartile deviation of the unselected group. Two thirds of the neurotic group, as against one third of the unselected group, fall below 96 I Q. Thus, a control group chosen at random

instead of by the method of pairing would differ from a neurotic group.

The similarity encountered in the two groups studied may be accounted for by the chance distribution in the two groups of such factors as faulty management and training resulting in bad habit formation.

Blanchard and Paynter [6, p. 33 ff.] analyze the etiology of the maladjustment of 500 problem children studied in child-guidance clinics. They conclude that since mental retardation and mental defect, speech defects, physical ills, personality difficulties, endocrine disturbances and misgrading in school occur with so much greater frequency in the problem group than in the control group, they are important factors in maladjustment. Thirty-three causative factors of maladjustments were listed. This multiplicity emphasizes, as do the authors, "that every problem child is an individual case, that we cannot generalize as to the cause of his difficulties, but must work out the etiology anew in each instance."

We must also pause to ask: "Do these causative factors, or combination thereof, necessarily result in a maladjusted child?" The answer must be no. The *sine qua non* is susceptibility of the subject under consideration. A situation that causes undue stress and strain on one child may be met squarely by another.

A consideration of child problem cases usually presents the disheartening picture of parents, as well as offspring, in need of adjustment. And yet, there is another side to the picture—a consideration of non-problem cases usually presents the heartening picture of parents, as well as offspring, satisfactorily adapted. Can we ameliorate the evil consequences of the reproduction of undesirable, unfavorable traits, which results in maladjusted, unacceptable personalities?

Eugenics is one impressive answer evoked by any consideration of the fact that the dependents, the defectives, the misfits that are our present problems come from stock that presented the same difficulties, and that the leaders in all fields of activity and affairs come from stock that presented the same advantages. The challenge of this answer of eugenics is one that takes us far afield from the confines of this limited study.

A second answer, one that seems more pragmatic and allows of immediate practice, involves application of the principles of

psychology and of mental hygiene as in the movement for habit clinics or child guidance clinics. Childhood has been called the golden period for mental hygiene.

As a result of his studies in genetic psychology, Watson says: "I believe I could make or break a youngster in the first four years of its life, i.e., without abusing it, starving it, or otherwise being cruel to it, I could twist, thwart, over- or under-develop its instinctive and emotional life to such a degree that it would never recover from it."

The neurotic child has "learned" many of his undesirable reactions in precisely the same way as his normal mate learned desirable reactions that did not bring him into conflict with accepted ways. Our educational organization, from the kindergarten through the university, must fully learn for its guiding principle—and then inculcate it in all with whom it deals—the psychological doctrine that behavior does not just happen, but that each act of conduct occurs in response to some stimulus, that some reason or motive produced the behavior; that the reaction which we make is the reaction that somehow was learned and fixed in our nervous system. Then can we hope for the time when each child will become the object of differential treatment; when the child's acts will not be considered for punishment, but when the stimuli that produced such behavior will be sought for possible modification; and when the importance of the early reactions in the early years will be realized for the inescapable part they play in determining the character we may later be called upon to modify.

Just as Binet, Norsworthy and others have taught that the subnormal child has no special or peculiar psychology,—their differences being of degree and not of kind,—so may we hope that the neurotic may soon no longer be marked out as belonging to a distinct psychological class sharply differentiated from his normal fellows. We must accept a normal curve of distribution for stability, just as we have accepted the normal curve of distribution for intelligence, and we must realize that the neurotic and unstable differ among themselves in intelligence and in ability to use well the intelligence they possess.

An analysis and comparison of the various test scores result in two main conclusions.

A. The group of neurotic children is not characterized by any particular status in intelligence and education that is peculiar to them and different from the status of the group of non-neurotic children with whom they were matched, but comparison with an unselected sample of the school population revealed that the neurotic group is below average in age-grade status and below par in intelligence.

B. The various tests performed by the two groups of children fail to yield any data by means of which the objective identification of the neurotic child might be furthered.

The findings on the points investigated may be summed up as follows:

1. The distribution of intelligence reveals that the neurotics match with a sample that is below par. Comparison of the neurotic group with an unselected group reveals that a greater proportion of neurotics are found among the stupid.
2. The school work of the neurotics is rather poor in terms of age-grade status. Their school work is "not poor" only in comparison with that of their non-neurotic mates, who are likewise retarded in age-grade status.
3. The handwriting of neurotics, as compared with the standard expected of their grade location, is poor as to quality, up to par as to speed.

The remaining points which were investigated reveal no distinguishing marks characterizing the neurotics.

4. There are no particular tests on the Stanford-Binet in which neurotics consistently fail or succeed, as compared with their non-neurotic mates.
5. The I Q's of neurotic individuals are as constant as those reported by many investigators for large groups of unselected children.
6. Neurotics show the same amount of scatter on the Stanford-Binet as do unselected children.
7. The neurotic group meet with about the same success on the Pintner-Paterson Performance Scale as do the non-neurotic group.

8. The cancelation tests do not reveal a difference in the two groups in carelessness and inaccuracy as measured thereby.

In all of these various findings, the differences within the neurotic group are much greater than the differences between the neurotic and non-neurotic groups.

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APPENDIX

CASE HISTORIES OF VARIOUS NEUROTIC INDIVIDUALS

Summaries of the diagnostic reports of some of the cases studied follow. These will give a picture of the kind of individual here dealt with as neurotic.

A. B.—A's family has been known to the Charity Association since 1916, when A's brother was brought to the Juvenile Court for stealing. In 1920 the mother brought A. to Juvenile Court, reporting both boys as truants, stealing and beyond the control of their parents. A. is described as an erratic boy, a bed-wetter and a smoker.

C. D.—The mother requested that the Charity Organization place out her children, as she was unable to care for them financially, and unable to control them since the father had died. C. had been brought to the Juvenile Court for stealing money. He was admitted to the Society's institution, where he proved very troublesome and continually ran away. Fear of punishment proved the only inducement to any improvement in behavior. His favorable character traits are that he has a cheerful disposition, is a good worker, and takes part in athletic activities. These are counterbalanced by his being very unscrupulous, deceiving, sly, lying, and aggressive. He is anxious for adults to think well of him, usually remaining in the background of pilfering episodes, using other boys as tools. He has had relations with girls several times.

E. F.—E's family became known to the Charity Organization when the Juvenile Court referred them, as the result of the arrest of E's brother for stealing. Home conditions were unsatisfactory due to domestic difficulties and bootlegging, and the children were placed in an institution of the Society. E. finds it hard to adjust to new people, was unhappy in the beginning, and has difficulty with the cottage mothers. She is described as very ill-natured and extremely resentful of discipline, always complaining about treatment, saying that people discriminate against her. Her attitude toward the experimenter was one of surly suspicion,—she was the only one of all the children interviewed who did not respond with interest and enthusiasm.

G. and H. I.—The father is an epileptic; he has been receiving attention at one clinic or another for various ailments for years. The brothers

have been stealing, hooking school and associating with an undesirable gang for several years. They were expelled from school and were then placed in an institution, where H., the younger one, adapted himself more quickly than G. They were both bed-wetters, and are trying to break the habit. After several months of good behavior, a new boy exercised a bad influence over them, and they relapsed into stealing, smoking, playing truant and carelessness about bed-wetting.

J. K.—J. is an illegitimate child who presented sex problems from babyhood and has been in an institution since five years of age. His present report described him as rather shy and bashful; somewhat dreamy and imaginative; institutionalized; absolutely dependent and helpless outside of his accustomed environment; quiet and retiring outside the institution, but loud and crude in the institution. He has no regard for property; is somewhat resentful when disciplined. J. was in a recent sex episode in progress for a number of months. He gets along well with the children, is interested in all their activities. When an attempt was made to place him in a boarding home about a year ago, he cried and pleaded not to be sent away from the institution.

L. M.—The father, though apparently of good intentions, never provided a proper home for the family to live in. The mother is an extremely stupid, weak-willed individual who is a most inefficient homemaker; none of her children seem to have any respect for her. L's sister is in a reform school. L. was brought into the Juvenile Court on a charge of larceny. His parents claim him beyond their control and want him placed out. He has given considerable trouble in school through impertinence and defiance to teachers. He has an ungovernable temper and has been suspended twice. His conduct continued so offensive after his second reinstatement, that the principal refused to continue him. Since his admission to the institution, there has been but one display of ungovernable temper, when upon very slight provocation, he hurled a stone at a boy.

N. O.—N. was suspended from school for being troublesome, his teachers claiming that he was disobedient, impudent and would curse; and N. complaining that his teachers were unjust to him. At his request, he was transferred to another school, but after a few weeks, he again gave trouble, exhibiting ungovernable temper, and refused to go back to school. He was then sent to an institution of the Society, on the advice of a probation officer of the Juvenile Court, where he had appeared on the charge of disorderly conduct. At the institution he was at first involved in several pilfering episodes. He seemed to like the institution, and was considered "straightened out" when suddenly he ran away in company with several other boys, and similar escapades followed. When brought back he was resentful and not repentant. He is described as restless, unstable, usually dissatisfied, and exercising a bad influence on the other boys by his dissatisfaction and moodiness.

P. Q.—P's family became known to the Charity Association when they needed assistance owing to the father's unemployment. Much domestic difficulty culminated in the parents' recent separation. The mother is coöperative but cannot cope with the two of her eight children who present disciplinary problems, and requested that P. be placed out, as he was remaining away from home until midnight and was stealing. He made a ready adjustment at the institution and was amenable to discipline. After his discharge home, he failed to make a good adjustment. In company with other boys, he again stole and was taken to the Juvenile Court. His mother requested that he be placed out again.

R. S.—R's character has been considerably disorganized for a number of years. He was reported to the Big Brother League, when seven years old, for truancy from school, great disrespect to his mother and strangers, and using most vile language. The mother is weak and can exert no influence, and the father would not coöperate with the Big Brother assigned to the case. The next year the mother requested that her boys be placed out, as they were incorrigible. R. remained in the institution only a few days, ran home and no effort was made to return him. R. has a Juvenile Court record for larceny, breaking windows, shooting crap, staying away from home overnight, selling papers without a badge, smoking, and so on. Both the judge and the Society ordered him placed out of his home.

T. U.—T. has been a problem since early childhood, with a Juvenile Court record of truancy, stealing and disorderly conduct. He was sent away from home where the living conditions were most deplorable. At the institution, his attitude was one of defiance and suspicion. This spirit of non-coöperation and unfriendliness was fostered to a great extent by the desire to enhance himself in the eyes of the other boys. He was expelled from school as impudent and unmanageable. In company with some other boys, he began a series of runaway escapades. He is controllable on the low level of punishment and physical cowardice; but his report now states that he is learning the difference between right and wrong, and that he is learning to adjust. However, his family organization is too poor to warrant returning there a boy of his neurotic make-up.

V. W.—V's father has deserted his family numerous times, the family receiving financial aid from the Society; V's mother is very unreliable and quick-tempered; V's older sister proved very troublesome. From this poor background comes V. with character showing great disorganization, as shown in lying, stealing, fighting and general restlessness. At the institution she is helpful in the cottage, but finds it hard to work with other children. She is a very poor mixer, with almost no friends in the cottage, where she is shunned by the girls, and she in turn shuns association. She is secretive and always anxious to confide to a new person about her past experiences. V. became greatly upset when one of the girls mentioned what V. considered a secret, and threatened suicide.

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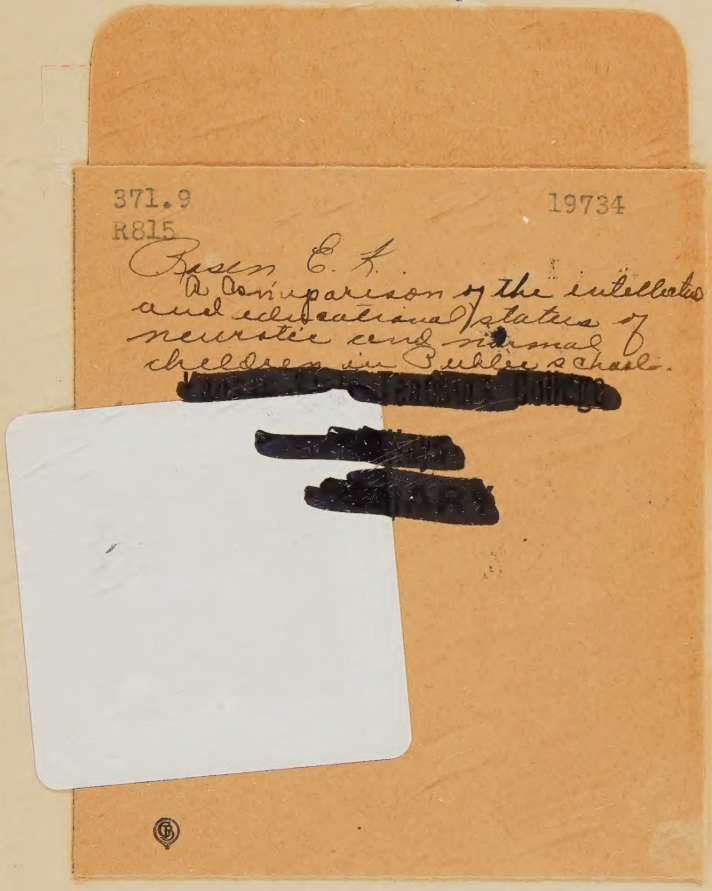

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Rosen E. F.

A comparison of the intellectual and educational status of neurotic and normal children in Public Schools.

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